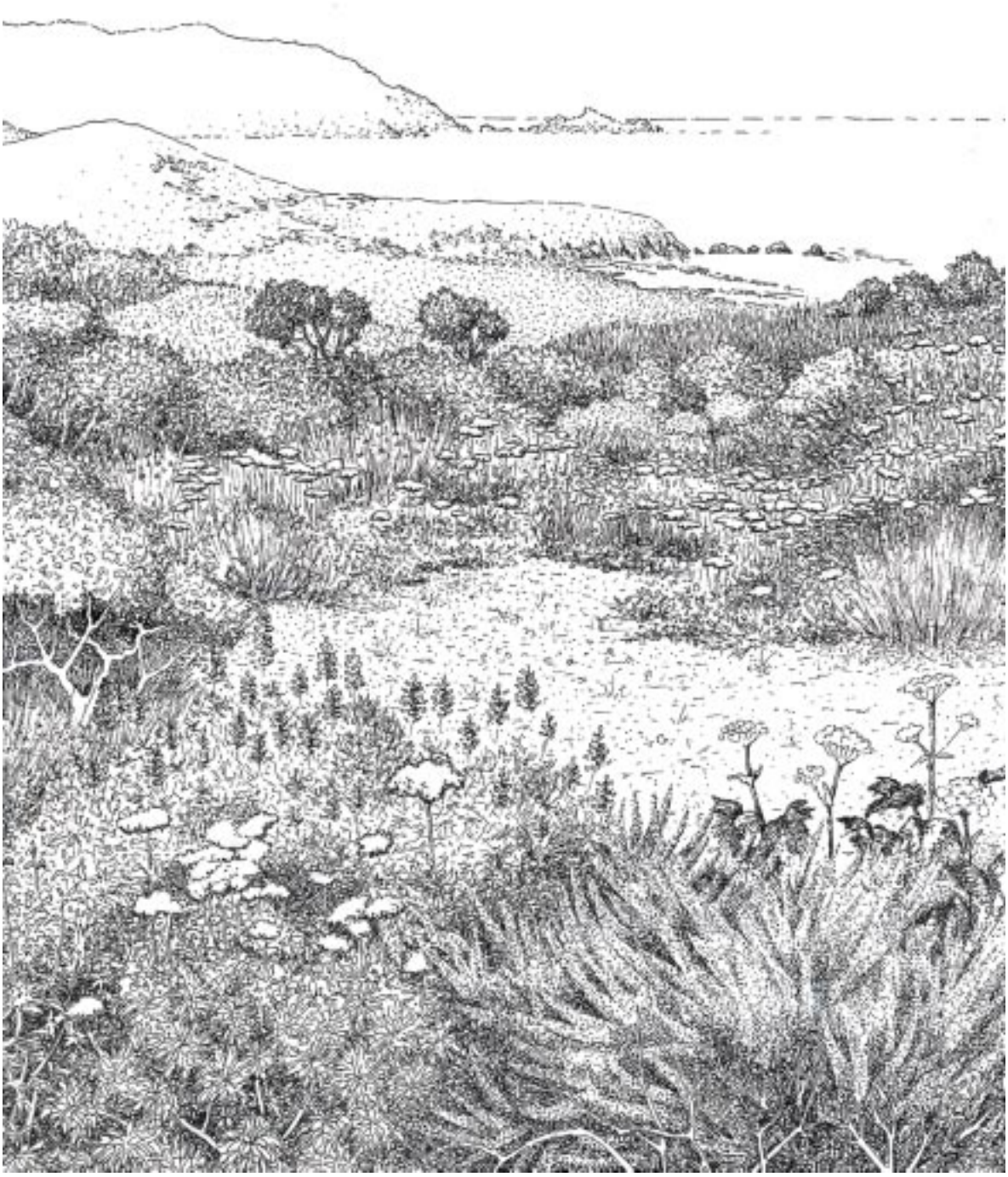
SECTION 1
WELCOME



WELCOME

Thanks for joining us as a nursery intern. The Oceana High School Native Plant Nursery is one of six native plant nurseries in Golden Gate National Recreation Area (GGNRA). The first nurseries were created at Fort Funston and Muir Woods in the late 1980s. Since then, thousands of natives have been **outplanted**, beginning the restoration of habitats throughout the park—from Milagra and Sweeney ridges near Pacifica at the south end of GGNRA to the Olema Valley near Tomales Bay at the north end. Our nurseries at Fort Funston, Presidio, Marin Headlands, Tennessee Valley, Muir Woods, and Oceana now grow about 120,000 plants per year. At Oceana, we hope to grow at least 3,000 plants annually. The other nurseries are on park land and are maintained by park staff. Oceana Nursery is the only one on a school campus, with students responsible for daily maintenance and keeping the plants healthy!

The nurseries have grown many of the species for the park's various plant communities. Dune plants have been a focus at Fort Funston and the Presidio. The coastal scrub community has been reestablished at Milagra and Sweeney Ridges at the south end of the park. At Wolfback Ridge around Waldo Tunnel (also known as the Rainbow Tunnel), north of the Golden Gate Bridge, Mission blue butterfly habitat restoration is an ongoing project. The restoration of Redwood Creek (from the head-waters above Muir Woods to Muir Beach), historic habitat for the threatened coho salmon and steelhead trout, is also in progress. Much has been accomplished, but there is much, much more to do.

As a nursery intern, you have an opportunity not only to **propagate** and grow the plants in the nursery, but also to participate in other parts of the **restoration cycle**, including **outplanting** at Milagra Ridge during the winter. We hope you'll get a chance to experience the entire restoration cycle while you are a student at Oceana High School. We're sure that you will learn a lot about **ecological restoration** and about our **native plants** and **habitats** during your internship. Perhaps your training and experience here will prepare you for future work in the fields of **biology**, **ecology**, or **horticulture**. Please ask questions and be sure to let your mentor know how we can help you learn and improve your skills throughout your internship. We want this to be a job you feel good about!

The Oceana nursery is part of a larger part program called *National Park Labs at Golden Gate* offered at Milagra Ridge in partnership with Oceana High School, and at the Presidio of San Francisco in partnership with the San Francisco Unified School District. High school interns also assist with nursery operations and public programs at the Presidio native plant nursery. *National Park Labs at Golden Gate* also includes field studies, a web site, and special teacher workshops.

National Park Labs at Golden Gate is a program of the National Park Service, National Park Foundation, and Toyota USA Foundation. The program is the first of its kind to provide high school students with experiences that enhance the quality of science and mathematics and foster stewardship of National Park resources. Five national park sites were competitively selected to participate in this exciting endeavor. The other NPL sites are Carlsbad Caverns National Park (NM) and Guadalupe Mountains National Park (TX), Lowell National Historical Park (MA), National Capital Region Parks (DC), and Santa Monica Mountains National Recreation Area (CA).

1.1 MISSION AND GOALS

Mission Statement

The native plant nurseries of GGNRA exist to support the ecological restoration in the park, to build a sense of community **stewardship** for the park, and to teach young people the themes of environmental **sustainability** and restoration by participation in the process in a spirit of quality, joy, and teamwork.

Goals

The GGNRA Native Plant Nursery Program works with other park programs to restore and preserve the native ecology of parklands and to build a strong and vibrant community of park stewards. The nursery program has three goals:

❶ Produce high-quality plants of appropriate native species as called for by park restoration projects.

❷ Create and foster a volunteer program that serves community needs for ecological recreation and builds a constituency around an ethic of ecological restoration and stewardship.

❸ Teach people, especially young people, concepts of community, ecology, and horticulture, utilizing the nurseries as hands-on experiential classrooms.

1.2 GUIDING PRINCIPLES

Parklands have been impacted by human use and need **ecological restoration**. Examples at Milagra Ridge include activities that took place during the military- and agricultural-use years. Land was bulldozed; roads, bunkers, and Nike missile sites were built; and weeds were introduced. As a result, native plants and animals lost important habitat.

■ The purpose of ecological restoration is to restore **biodiversity** and ecological function. Our goal is to restore natural processes that support many native plant and animal species, including those currently listed as rare or endangered. One way we can restore natural processes is by removing **invasive weeds** and planting native plants to recreate critical habitat for native animals.

■ The most effective long-term ap-

proach to restoration is **community stewardship**. The park sets restoration priorities with meaningful community participation before, during, and after the planning process. We involve the community as much as possible in the planning, implementation, and monitoring of revegetation plans. This means we welcome your input in our planning for Milagra Ridge. We hope that you will attend our meetings; make the acquaintance of community members who are involved; and invite your family, neighbors, and friends to join us. Please speak up when you have ideas!

■ Outplanting of native container plants achieves the highest **probability of success**. We are growing plants at the Oceana Native Plant Nursery for Milagra Ridge because revegetation of a disturbed area is more likely to be successful if we plant plants rather than seeds in these areas.

■ Seeds are collected as locally as possible, preferably within the watershed of the project. We grow plants at Oceana Native Plant Nursery from seed collected only at or near Milagra Ridge. The plants are well adapted to the conditions of Milagra Ridge because they have evolved here over many centuries.

■ **Biological and genetic diversity** are critical to the continuation of the **evolutionary process**. To get the greatest diversity or variety in our plant material, we collect seed from many species from all over the ridge and do not grow plants from **cuttings** if we can successfully grow them from seed. When we take cuttings, as we do with strawberries and sometimes **woody shrubs**, we are growing **clones**, plants with the exact same genetic material as the parent plant. On the other hand, seed is usually genetically different from the parent plant, since the flowers were fertilized by pollen from a different plant.

■ Nurseries are ideal centers for teaching the importance of stewardship and ecological concepts. Your role will include running the nursery and also teaching other students what we do, why we do it, and how this work is part of the stewardship of Milagra Ridge.

■ All volunteers, staff, and students are to be treated with respect and dignity. Please help us to be sure that nursery workdays and other activities feel respectful to you and other students, staff, and volunteers.

■ People from all communities have an opportunity to contribute. The direction and operation of the nursery program evolve in a spirit of teamwork. We want your input. Bring your friends, family, and neighbors to workdays. Let us know how we can improve the program for you, other participants, the nursery, and the restoration of the ridge!

1.3 THE CREATION OF GOLDEN GATE NATIONAL RECREATION AREA

Milagra Ridge, The Presidio of San Francisco, Marin Headlands, Tennessee Valley, Fort Funston, and Muir Woods are part of one park, Golden Gate National Recreation Area (GGNRA), one of over 378 areas within the **National Park System** of the United States, Department of the

Interior. The areas within the National Park System cover more than 83 million acres in 49 states, the District of Columbia, American Samoa, Guam, Puerto Rico, Saipan, and the Virgin Islands. Each site has certain ideas or themes that distinguish it. They are of such national significance as to justify special recognition and protection in accordance with various acts of Congress. California has 23 national park sites,more than any other state. The National Park Service is responsible for protecting all these sites.

The concept of a national recreation area that officially linked together the green and open spaces of the Bay Area was proposed in 1971 by both of San Francisco's congressmen, William S. Maillard and Phillip Burton. However, these lands have a history that reaches far beyond their relatively recent addition to the National Park System.

The lands within and beyond this park have been used for many thousands of years by **indigenous peoples**, most notably the Coast Miwok and Ohlone, who have inhabited the northern California coast for as long as 10,000 to 15,000 years. Imagine the richness and depth of their knowledge of the plants and animals of the area. **Preservation** of the immeasurably rich cultural history of the indigenous people in what are today parklands is one of GGNRA's primary missions.

When the Coast Miwok and Ohlone first arrived, the sea level was far below where it is today. The coastline may have been as far out as today's Farallon Islands. The inland areas (the area now within the boundaries of GGNRA and Point Reyes National Seashore) may have had great redwood stands. Geologically, the coastal area is extremely active. Changes in coastal topography occur each year as the ocean erodes the coastal bluffs and cliffs, and earthquakes and winter storms shift and pound the unstable **bedrock**.

The Coast Miwok are the people Sir Francis Drake would have encountered in 1579, when Europeans set foot on this coast for the first time. Drake was on the run with a pirated shipload of twenty-six tons of silver and sought safety in or near the bay, somewhere in what is now Marin County. Two hundred years later, the Spanish had pushed the limits of their New World empire as far north as the San Francisco Bay.

Mexico, including Alta (or northern) California, gained independence from Spain in 1822. The outposts of San Francisco and Sonoma had very little contact with Mexico City and were very lightly fortified. With the Bear Flag Revolt in 1846, John C. Fremont captured the San Francisco Bay Area for the United States. The new owners wanted no such military vulnerability, and in 1850, U. S. President Millard Fillmore signed an executive order setting aside "for public purposes" land on both sides of the Golden Gate—what are now the Presidio and Fort Mason in the south and the Marin Headlands to the north. Some of the land, particularly on the northern side, was privately owned. For instance, much of the Headlands was used for dairy farms owned for several generations by Portuguese families.

Beginning in 1890, American military installations around the Golden Gate were strengthened. These improvements continued throughout until the end of the Spanish-American War (1898), but growth slowed during the era of World War I (which ended in 1918). In 1935, San Francisco's forts again came to prominence with threats of a possible invasion from Japan. New batteries were built and old ones upgraded; they stood guard through World War II (which ended in 1945). The Cold War brought Nike antiaircraft missiles and radar towers, remnants of which are still visible throughout

the park. Many of these lands eventually became surplus to the military's needs.

President Truman's 1945 offer of the Presidio as a potential United Nations headquarters planted the idea that these military lands were expendable. The City of San Francisco pushed to develop the Presidio for housing, but this effort was successfully resisted. In the 1960s, the government began selling off pieces of property. The Marin Headlands, site of a proposed new town called Marincello, was saved by internal disagreement and a legal hold-up that eventually halted the project after public outcry and the efforts of conservationists were ignored by Congress.

By the early 1970s, the concept of a **greenbelt** stretching from the South Bay north to Point Reyes had emerged, and Maillard and Burton vigorously pushed the legislation that created GGNRA through Congress. The political climate of the day allowed an increase in the federal budget, especially for the National Park System. President Richard Nixon visited the Bay Area in 1972 to see first-hand the grand vision of the new urban National Park. He signed a bill later that year authorizing funds for GGNRA.

The lands comprising the park were gradually acquired from a number of sources, beginning with former military bases (Forts Cronkhite, Baker, Mason, Funston, and Miley, and in 1994, the Presidio of San Francisco). Alcatraz, a tiny island in the middle of the bay and home of the infamous federal penitentiary between 1934 and 1963, had been closed by Attorney General Robert Kennedy and was considered excess to the needs of the Department of Justice when it was incorporated into GGNRA. The City of San Francisco decided that some of its beach and park properties were too costly to operate and gave them to the National Park Service (Aquatic Park, Lands End, Ocean Beach, and Sutro Heights Park). One of the most recent acquisitions is the Phleger Estate in Woodside. Today, the total number of acres within the authorized boundaries of the park is approximately 76,000, distributed among San Francisco, Marin, and San Mateo counties. It is the world's largest urban national park.

1.4 INTRODUCTION TO MILAGRA RIDGE

Natural History

Milagra Ridge includes a relatively flat ridge top, two hills on the southeast and northwest sides of the ridge with peak elevations of 710 and 672 feet respectively, and steep slopes draining into Milagra Creek on the northeast and into an unnamed drainage basin on the southwest. There is also a settling pond in the eastern portion of the ridge that was created by the military for sewage treatment. The **settling pond** has since developed into an important wetland habitat for many species, including the endangered red-legged frog.

Coastal scrub and **coastal prairie** are the major plant communities found on the windy, often-foggy, exposed slopes of Milagra Ridge. Coastal scrub dominates the slopes, and **assemblages** of mixed scrub and prairie (grassland) species occupy the ridge top. Common indigenous species on Milagra Ridge include coyote bush, bush monkey flower, California sagebrush, California poppy, coffee berry, California blackberry, several species of strawberry, toyon (Christmas berry), twinberry, elderberry, Indian paintbrush, Phacelia, gumplant, and several native

grasses. Silver leaf lupine (*Lupinus albifrons*) is a small and uncommon plant that supports a population of the federally listed endangered Mission blue butterfly (*Plebejus icarioides missionensis*). Sedum, a succulent plant found in rocky outcroppings, supports the federally listed endangered San Bruno elfin butterfly (*Callophrys mossii bayensis*).

Indigenous animals found on Milagra Ridge include the gray fox, bobcat, skunk, raccoon, gopher, mice and vole, black tailed deer, coyote, garter snake (possibly including the rare San Francisco garter snake), gopher snake, and Western fence lizard. Many types of birds, including American kestrels, red-tailed hawks, scrub jays, hummingbirds, and ravens can be seen here. (For a detailed description of the endangered animal species of Milagra Ridge, see page 80.)

Human History

Native Ohlone people inhabited the land we now call Milagra Ridge and Pacifica for thousands of years. Their lives probably included seasonal harvesting of seed, greens, and fruits and hunting for local animals. In the late 1700s, the Spanish mission of San Francisco de Asis established farms in the area, and the hills of Pacifica became part of Rancho San Pedro. Livestock grazing began an agricultural era that lasted until the mid-1900s. Artichokes were grown atop Milagra Ridge until 1938, and the furrows can still be seen today.

In the late 1930s, the U.S. Army acquired Milagra Ridge as part of a project to defend the San Francisco Bay. Several batteries were proposed but never built. In 1948, 6-inch guns were mounted at Milagra Ridge, only to be removed between 1949 and 1950.

In 1956, Nike Missile Site SF-51 was established at Milagra Ridge. The Nikes were surface-to-air missiles used during the Cold War era to defend against attacking aircraft. The original Nike-Ajax system used conventional explosives and had a twenty-five-mile range.

In 1958, the site was converted to the nuclear-capable Nike-Hercules system, whose missiles had a ninety-mile range. The site included the missile launch site with elevators, a helipad, and bleachers for visitors to view the elevation of missiles to firing position. Guard dogs were kenneled and trained, troops were housed, and administrative offices were operative in the area now known as Spyglass Ridge. For this military site, much of Milagra Ridge was flattened and paved. The entire area was fenced with barbed wire and patrolled by guards with dogs.

In 1963, the U.S. Army turned the area over to the National Guard, and in 1974, use of the site was discontinued. The buildings were demolished, launcher pits buried, and asphalt removed. The National Guard gave the land, then valued at $180,000, to the City of Pacifica as an open space park. Local people began to use the park for walking, hunting, and running their dogs.

In 1987, GGNRA acquired Milagra Ridge and began to work with the community to restore the land while retaining its recreational value.

1.5 PARTNERSHIP BETWEEN OCEANA HIGH SCHOOL AND GGNRA

Milagra Ridge, a 240-acre parcel of land located directly above Oceana High School, became part of the GGNRA in 1987. Noting that the area was home to rare and endangered species, including

the Mission blue butterfly, the National Park Service focused its efforts on the ecological restoration of the ridge. Several large-scale projects to remove invasive pampas grass that had formed a **monoculture** over much of Milagra Ridge were initiated.

In 1993, Milagra Ridge became one of the restoration sites overseen by the Site Stewardship Program (SSP), which is dedicated to working with communities to restore high-priority, ecologically sensitive sites within GGNRA. After several years of working with the Pacifica and ridge communities and Sharp Park Elementary School, dialog developed between Oceana High School and GGNRA, and a plan emerged.

Early in 1996, a series of meetings between the park and the school resulted in a plan for the involvement of students and teachers in the restoration of Milagra Ridge. Objectives included the reconstruction of the native plant nursery on the school campus, the formation of an environmental studies class to learn about ecological concepts as part of the science curriculum, the formation of a diverse core group of students committed to stewardship of Milagra Ridge, and the creation of a convenient way for students to earn community service hours needed for graduation.

In 1997, the program began with a new environmental studies class (taught by Rachel Kalish) and the reconstruction of the nursery. Students, school, and park staff worked side-by-side to construct the greenhouses and a shade house. Paid high school student internships began in 1998, when the project received a grant from the Toyota USA Foundation to create the National Park Labs program at five national parks across the country. Like their peers at Carlsbad Caverns National Park (NM) and Guadalupe Mountains National Park (TX), Lowell National Historical Park (MA), National Capital Region Parks (DC), and Santa Monica Mountains National Recreation Area (CA), Oceana students began to participate in the restoration and planning for national park sites. At Milagra Ridge, they worked in the nursery and participated in all phases of the restoration cycle. Students became involved in plant propagation, nursery maintenance, planting native species on the ridge, weeding, monitoring, and seed collection.

In the beginning, student interns worked with student volunteers to build and improve the nursery facilities. The GGNRA and Site Stewardship staff and interns planned weekly nursery workdays and monthly classroom activities. Now, new interns are hired every six months. We hope that student volunteers will continue to become interns and that many students will attend restoration workdays, both to earn community service hours and because they want to participate in the stewardship of the land.